Letters to the Editor.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

The Plumage Bill and Bird Protection.

AT the present time there is a measure before the House of Commons known as the Importation of Plumage (Prohibition) Bill, the object of which is "to prohibit the importation of the plumage of birds and the sale or possession of plumage illegally imported," excepting the plumage of ostriches and eider ducks, but "the prohibition or importation imposed by the Act shall not apply to any plumage imported in the baggage or as part of the wearing apparel of a passenger." The Bill further provides for the granting of a licence, subject to certain conditions and regulations, authorising the importation of plumage for natural history museums, for the purpose of scientific research, or for any other special purpose.

In connection with this measure numerous conflicting interests are threatened and grave misunderstandings exist, due very largely to lack of knowledge of the actual facts. Whilst yielding to no one in my love of wild birds and all the æsthetic interests associated with wild-bird life, I cannot shut my eyes to the fact that a considerable amount of sentimentalism, misrepresentation, and exaggeration has been put forth by supporters or well-wishers of this measure, and similarly by the opposers respecting trade losses, the extent of the employment the trade ensures, the absence of cruelty involved in the trade, etc. Neither of these views helps us to understand the situation or calmly and dispassionately to form an unbiassed opinion, for both of them are far from the actual truth.

There is now ample evidence to show that a considerable trade is done in the plumage and skins of wild birds which are largely utilised for the decoration of women's hats, etc. In different centres, such as London, Manchester, Paris, Berlin, Vienna, and elsewhere, this trade affords employment to a number of workers. The "horrors and barbarities of the traffic" have been luridly described by one set of writers and denied by another. Without accepting either of these sets of exaggerated statements, information in my possession shows that gross cruelty is frequently committed. Prof. E. H. Forbush states that brutal savagery is characteristic of this phase of bird destruction, and points out that this "has been well illustrated in the extermination of the egrets of the United States." No unprejudiced mind can exonerate or satisfactorily explain away this highly objectionable side of the question.

Of the species of birds sought after, we are constantly being assured that they are injurious, that they are "as common as rooks," or that we do not possess any exact information as to the effect this trade has had upon their numbers. The fact is that the majority of the species are beneficial so far as agriculture or horticulture is concerned, and only a very few injurious. There is exact and incontrovertible evidence that where thirty-five or forty years ago millions of birds existed, they are now practically extirpated. A single "rookery" of egrets was estimated by a well-known ornithologist to contain three million birds in 1878; in 1888 they were rare, and in 1908 almost extinct.

It is pointed out by supporters of this Bill that prohibition laws exist in America, Australia, India, and elsewhere, but it is not mentioned that, in the opinion of many competent judges, in consequence of such laws certain beneficial species of birds have suffered and injurious ones unduly increased.

Again, it has been suggested that such birds as egrets might be cultivated in natural reserves, and their plumes or "aigrettes" collected as the birds moult. The most perfect of such feathers, so we are informed, fetch as much as 2*l.* apiece. That the farming of these birds is a practicable scheme is proved by the fact that the National Association of Audubon Societies in the United States has established such a colony on a small island in the Stono River, near Charleston, and in 1917 it was tenanted by more than four hundred birds. Again, on Avery Island, Louisiana, U.S.A., there is a "rookery" of snowy egrets which in 1916 was carefully examined by Prof. J. S. Huxley, and reported to contain between eight and nine hundred nests. It may be well, perhaps, to remind the advocates of such schemes that, like all members of the family Ardeidæ, herons and egrets subsist very largely upon fish, and there is little doubt that the establishment of a series of large rookeries would have a disastrous effect upon fresh-water fisheries.

Whilst in no manner advocating opposition to this Bill, we must face the question: Supposing that it is placed upon the Statute-book, shall we have done anything to stop the trade in the skins and plumage of wild birds? Personally, I have grave doubts whether the object desired can be obtained by this measure. As an Act of Parliament its example and influence may be for good, but it will certainly not put a stop to the plumage trade. It must be realised that if we prohibit this trade in London, it will still flourish in Paris, Berlin, and elsewhere. The Bill will simply move the venue of the market; it will not bring about a smaller demand. To put an end to this we must educate the public; not by giving currency to wild and often inaccurate statements, but by teaching the rising generation "to view the question of the preservation of wild-bird life from a higher and much truer standpoint than heretofore. That wild birds have a utilitarian value no one can deny, but they also have an æsthetic value far outweighing all others. . . . Surely the general public have some rights where beautiful natural objects are concerned. . . . Posterity will undoubtedly regard us—and who shall say not rightly?—as stupid people, dull of apprehension and procrastinating in nature, in that we have permitted various species of wild birds, one after another, to disappear from our land; and our children's children will rise up and ask why we did not secure to them the natural pleasures which their forefathers could have enjoyed had they had eyes to see with and minds tuned beyond the din and bustle of the highways and byways of commerce" (*National Review*, 1920, p. 95).

Whilst the decoration of the person with wings and feathers may be regarded as the vulgar and depraved fancy of a day, the fact cannot escape us that there is a large section of the general public who are willing to pay high prices for these goods; and so long as this demand continues, so long will a supply be forthcoming.

By making the Plumage Bill a law of the land we can say that in this country we will have nothing to do with the trade and that it shall be prohibitory to carry on the trade in the United Kingdom. That it will have any effect on the destruction of wild-bird life, however, is certainly most unlikely. A plentiful supply

© 1920 Nature Publishing Group

of the goods will be forthcoming so long as a demand exists, but once it is regarded as offensive—or shall we say indicative of a lack of good taste?—to wear such things as the wings, heads, feathers, or bodies of birds, the demand will cease and the trade, so far as this country is concerned, disappear. Herein, we think, lies a remedy far more effective than any Act of Parliament. Walter E. Collinge.

The University, St. Andrews, March 27.

The Physiology of Migrations in the Sea.

The flat-fishes of Northumberland in the immature condition migrate more or less inshore in summer and offshore in winter. Flounders are relatively static, plaice migrate offshore to the north-east and dabs to the south-east. The migration is not, as a rule, conspicuous, and, so far as the young stages are concerned, might be regarded as not taking place.

With approaching maturity, however, these three species migrate far to the north. The flounders for the most part reach the coast of Fife, and the plaice deeper water off the Forth and the Scottish coast to the north. The dabs do not appear to migrate so far to the north as the plaice, but we have a record of one that migrated so far as St. Andrews Bay. Fulton has shown that the Moray Firth plaice migrate to the north, and even to the Atlantic.

The migrations may be said, therefore, to be a series of seasonal inshore and offshore movements, followed by a marked contranatant journey for spawning. After spawning the spent fish resume the seasonal migrations, and become then, more obviously, summer inshore migrants.

We have thus plainly two factors at work: one external, which may be associated with temperature, the other internal, which we at once conclude to be due to the action of an internal secretion. The seasonal migrations are obviously independent of the spawning migration, and may be said to be produced by hydrographical conditions and the contranatant ability of the fish. Under the influence of the spawning impulse fish migrate usually to a great, and sometimes to an immense, distance. The effect is strong enough to force the eel to descend from fresh water to the sea, and thence to mid-ocean, and to impel the salmon from the sea to the river, and, in spite of difficulties, to the spawning-ground.

The spawning migration is not always so plainly marked, but these considerations go to show that all fish migrations are of a similar character, a general seasonal series of movements affecting all, and a special migration under the dominating influence of an internal secretion or hormone, which, proceeding from the developing gonad, is carried by the blood to the nervous system. With reference to the species referred to above, it can be said that the hormone begins to exert its influence about autumn or the later months of the year, and continues its effect during the whole period of ripening. It is periodic in its manifestations, and the call, when it comes, is imperative. Only in special circumstances, as lack of water, say, in the river, can the spawning migration be said to be modified by hydrographical or other physical conditions. The distinction between the two kinds of migration must be clearly kept in view if we are to understand and appreciate the results of marking experiments. From, say, November to the spawning season mature plaice are contranatant migrants; after spawning they are denatant, or usually so, until the winter. The large number of records which have been accumulated, resulting from the investigations of past years, should be reconsidered with this in mind.

It is interesting to observe that the only invertebrate of the migration of which we have direct proof behaves almost exactly like the plaice and the flounder. The common edible crab (*Cancer pagurus*) migrates inshore in summer and offshore in winter with the greatest regularity. Maturity impels the female to become a contranatant migrant. The females migrate from the Northumberland coast to the southern coast of the Firth of Forth, some of them still further to the north, even to the Moray Firth, the general results indicating a direct relationship between size and distance. The hormone is therefore secreted in the crab by the developing ovary, and it reacts in exactly the same way as that of the fish. The experiments have clearly proved that the migration does not occur until the winter before the season of spawning, and in this respect the crustacean and the fish are in agreement. It takes place during the offshore winter migration and in deep water, but the effect is differential, the male not migrating. It is not necessary for the male to migrate, as the migration takes place after pairing, even a year or two years after. This appears to indicate that the internal secretion is under control or may be withheld in response to evolutionary necessity.

Dr. Gurley, in the *American Journal of Psychology* (1902 and 1909), brought under review the indications of the intoxication of the central nervous system by internal secretions as explaining the spawning migrations of fresh-water fish in North America; so that the point is not new. We do not know very much about the internal secretions, but we know enough to be able to say that they act directly and quickly as an intercommunication between organs with or without reference to the nervous system. In the sea the effects are indicated by migration in the case of such animals as are capable of making migrations, but it is obvious that in many cases the internal secretions derived from the gonad have somatogenetic as well as mental effects, as in the development of secondary sexual characters.

The developing gonads of fish and the crab offer interesting material for the investigation of internal secretions by a biochemist. My main object, however, is to indicate that we already know the general facts and laws of migration, that marking must be done intelligently and the results read with due consideration of the laws, and more especially that the spawning migration is due to an intoxication of the central nervous system, and brings about a migratory result independent of temperature, salinity, and every other hydrographical condition.

Alexander Meek.

Armstrong College, Newcastle-upon-Tyne,
March 30.

Muscular Efficiency.

When muscular force is exerted, power is expended and fatigue is produced, even when the muscle remains stationary. Again, when no external force opposes the contraction of the muscle, physiological causes set a limit to the speed at which contraction can take place. In both cases the whole power expended is lost in so far as the production of useful work is concerned. When there is no velocity the power is used in maintaining the stress, and when there is no resistance, in maintaining a constant velocity.[1]

In all ordinary muscular operations both these sources of power leakage act simultaneously but in

---

[1] This loss is independent of any power lost in the acceleration of the parts.

© 1920 Nature Publishing Group